What is claimed is:

1. A microfluidic reactor for trapping one or more particles of predetermined nominal size or range of sizes, comprising:

a flow inlet;

a transparent capillary for providing an in-situ zone for analysis; and

a porous filter integrated with the transparent capillary, the filter having a plurality of holes defined therein, the holes being smaller than the nominal size or range of sizes and arranged so as to trap the particles in the analysis zone while a fluid flows from the flow inlet through the analysis zone and the filter.

2. An apparatus as claimed in claim 1 wherein the filter extends laterally across the analysis zone.

3. An apparatus as claimed in claim 1 wherein the flow inlet defines a flow axis and the filter intersects the flow axis so as to form a porous reaction chamber.

4. An apparatus as claimed in claim 3, wherein the holes of the porous reaction chamber is substantially hexagonal.

5. An apparatus as claimed in claim 1 wherein the holes are defined between walls of a plurality of small capillaries smaller than the transparent capillary.

6. An apparatus as claimed in claim 5 wherein the plurality of small capillaries are substantially parallel.

7. An apparatus as claimed in claim 6 wherein the transparent capillary comprises at least one rectangular tube to form a planar surface.

8. An apparatus as claimed in claim 1, wherein the transparent capillary is made from glass.

9. An apparatus as claimed in claim 1, wherein the transparent capillary is made from a polymer.

10. An apparatus as claimed in claim 1, wherein the transparent capillary is coated with a solvent resistance.

11. An apparatus as claimed in claim 5, wherein the transparent capillary is heated with the plurality of small capillaries in a collapsed region.

12. An apparatus as claimed in claim 1, wherein the smallest dimension of the transparent capillary is smaller than the size of two particles.

13. An apparatus as claimed in claim 1, further comprising a manipulation system for moving more than one microfluidic reactor in a high throughput bio-assay operation.

14. A microfluidic reactor for trapping one or more particles of predetermined nominal size or range of sizes, comprising:

a flow inlet;

a transparent capillary for providing an in-situ detection zone wherein the detection zone is arranged so as substantially to correspond in shape to an optical detector; and

a porous filter integrated with the transparent capillary, the filter having a plurality of holes defined therein, the holes being smaller than the nominal size or range of sizes and arranged so as to trap the particles in the detection zone while a fluid flows from the flow inlet through the detection zone and the filter.

15. The reactor of claim 14, wherein the particles comprise microbeads.

16. The reactor of claim 14, wherein the optical detector comprises a charge-coupled device for detecting light coming from the reaction in the detection zone.

17. A method for trapping one or more particles of predetermined nominal size or range of sizes, comprising the steps of:

providing a flow inlet;

providing an in-situ transparent analysis zone;

integrating a porous filter with the in-situ transparent analysis zone, the filter having a plurality of holes defined therein, the holes being smaller than the nominal size or range of sizes;

flowing a fluid from the flow inlet through the analysis zone; and

trapping the particles in the analysis zone while the fluid flows through filter

18. The method of claim 17, wherein the flowing step comprises reacting the fluid having an analyte with a probe immobilized on a plurality of particles.

19. The method of claim 17, wherein the flowing step comprises flowing a fluid of whole blood cells.

20. The method of claim 18 further comprising scanning the trapped particles for a visible result of the reaction in the detection zone.